Small Business Innovation Research/Small Business Tech Transfer

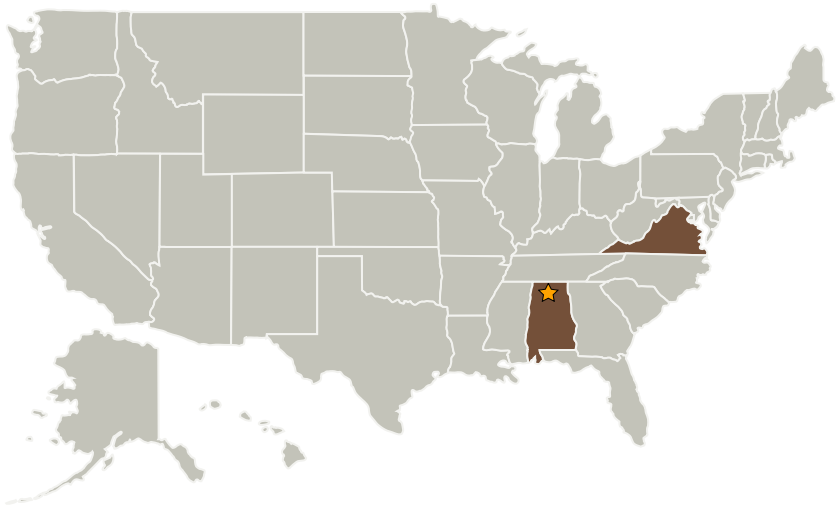
Integrated Fiber Optic Sensor and Modeling System, Phase I

Completed Technology Project (2004 - 2005)

Project Introduction

Advanced space fission systems are being developed as safe and affordable space propulsion alternatives for long-term space exploration. The characterization of non-nuclear test core simulators is limited by the lack of instrumentation options available for temperature and strain measurements. Luna Innovations proposes to develop sensors based on a fiber Bragg grating system for temperature and strain measurements. These fiber optic sensors can provide 20 to 100 times more sensing points as thermocouples on interior and exterior surfaces of the core simulator, which are expected to reach temperatures of 1000?C. In addition, Luna Innovations will work with a university partner to develop a modeling strategy to characterize the core by comparing critical data collected during operation (power distribution, temperature, strain, etc.). Hence, an array of sensors will map the physical responses of the core and produce a working feedback model for use in optimization studies of the system.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Luna Innovations, Inc.	Supporting Organization	Industry	Roanoke, Virginia

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

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Primary U.S. Work Locations	
Alabama	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.6 Instrumentation and Health Monitoring for EDL